

DOCUMENT "A"

REPORT ON SURVEILLANCE

OF

DEEP WELL UPSET AND SUBSEQUENT ACID DISCHARGE AT CABOT CORPORATION

Tuscola, Illinois

April 10, 1973 to April 17, 1973

EPA Region 5 Records Ctr.



298867

April 10, 1973

3:30 p.m.: Dr. William Tambo, Plant Manager, Cabot Corporation's Tuscola Plant, calls the writer to inform that they believe damage has occurred to the tubing in their acid disposal deep well. A drop in the annulus pressure had been detected at 3:00 a.m. on April 9. To continue using the well might result in permanent damage to the casing. Therefore, they had decided to pull the tubing for inspection. "Turn around time" for this operation is 5-10 days barring any severe complications. During this period the acid waste normally disposed of in the well after passing through a settling pond will overflow from the pond to waters of the State. When scheduled maintenance is performed, the pond levels are lowered in advance to provide storage during the "turn around". However, this problem was not scheduled. The overflow began occurring late on April 9 and a pH check by Cabot personnel showed a pH of 2.0 at their property line where flow enters the field tile system of Drainage District #4, Tuscola Township. The ^{tile}~~tile~~ system opens approximately two miles southeast of the plant to form an unnamed branch of the Scattering Fork. Normally, Cabot contributes 40 gpm of Nash

pump seal water and some surface runoff (access road, parking lots and roof) to this tile system. However, with the deep well out to operation, an additional 50-70 gpm of highly acidic wastewater was being discharged. Dr. Tambo indicated the rigging crew would be in early on April 11 to begin pulling the tubing. The writer suggested that emergency measures be taken to provide neutralization by using limestone, soda ash, or caustic. It was also pointed out that Cabot would be responsible for any resultant violations of the EPAct and Water Pollution Regulations of Illinois.

4:30 p.m.: Sanitary Inspector John Bell departs to collect samples and check field pH's to determine severity of problem.

4:45 p.m.: Dr. Tambo calls again. Fine limestone (one inch pea gravel) has been ordered to place near the end of the pond in a berm formation so that all acidic water must filter through it. Also negotiating to obtain sodium carbonate or caustic for additional pH adjustment. Sample collected at property line (B-1) had 5200 ppm chlorides and a pH of 1.3; and, at the outlet of the field tile system (C-1) had 950 ppm chlorides and a pH of 2.1.

5:00 p.m.: Attached telegram (p. 9) from J. J. Forneris advises Cabot that discharge may be a violation of the Environmental Protection Act and Water Pollution Regulations of Illinois.

5:15 p.m.: Sanitary Inspector Chuck Hall returns to office and indicates routine effluent sample was collected at 10:00 a.m. that morning. He reported a "white turbid" appearance. Laboratory personnel found the sample to have a pH of 1.1 (See page 21). Hall's presence may explain why Cabot chose to report the incident.

5:00 p.m. - 7:00 p.m.: Sanitary Inspector John Bell conducts stream sampling survey. Sampling stations have been established as shown on the quadrangle map on Page 10 and all sample result summaries and laboratory sheets have been cross-referenced with this map. The results of Bell's survey are summarized on Page 20.

April 11, 1973

10:00 a.m. - 2:00 p.m.: EFE Rich Ryczek and the writer visit Cabot. Dr. Tambo and Mr. Russell Hamm are interviewed. Limestone dikes are nearly complete (Picture #'s 1-3 on Page 11). It had been necessary to open a rock quarry late yesterday to obtain the limestone and a man had worked all night constructing the dikes. Soda ash is also being added at a junction box (Picture #'s 5 & 6) for additional pH adjustment. Hopefully by tomorrow they will be set up to feed 50% liquid caustic to this junction box. The following time table should be feasible provided no major problems are encountered:

All tubing pulled by April 12th.
All tubing tested by April 13th.
Casing logged on April 14th.
Tubing replaced on April 15th.
Back in operation on April 16th.

Spare tubing is on hand should the testing reveal any faulty sections in need of being replaced.

Dr. Tambo indicated a similar failure had occurred last summer but the ponds were low enough to provide sufficient storage and no overflow occurred. Therefore, they did not report it. It should be noted that the ponds in addition to receiving normal wastewater also receive contaminated surface and sub-surface drainage. Had it not been for the unusually wet spring, sufficient storage might have been available during this failure.

The well is normally pulled and inspected every six months according to Tambo.

Before leaving, the neutralization activities were observed and a sample of the discharge at the property line was collected. (See Picture #'s 7-8) The discharge had a white milky color and was obviously high in suspended solids. Utilizing pH paper, the field pH at this point was determined to be approximately 7.0. Dr. Tambo hoped that the suspended solids would be reduced somewhat when they began using the liquid caustic.

The oil was being pumped from the outer annulus and the rigging crew was about ready to begin pulling the mile deep tubing.

After leaving the plant, a stream sampling survey was conducted at the stations originally established. A summary of the results of that survey and of comments and observations is presented on Page 27. The effects on the receiving stream are shown in Picture #'s 9 and 10 on Page 13.

April 12, 1973

9:15 a.m.: Russ Hamm calls to report that the tubing removal is about 65% complete. Of those sections pulled, two of the couplings have small cracks and are not expected to withstand the pressure test. The testing should take place tomorrow and the logging on Saturday as scheduled. A maintenance man was on duty all night adding 3-5 100# bags of soda ash per hour. Four samples were collected at the property line and pH's in the range of 6.2-7.9 were detected in these samples. A truck load of 50% caustic is expected to arrive around noon. The riggers worked continuously ^{except} ~~except~~ from midnight to 6:00 a.m.

2:00-4:00 p.m.: Writer visits Cabot. Russ Hamm interviewed. All the tubing has now been pulled. Other than the two couplings mentioned earlier, nothing unusual was obviously visible. If the pressure testing reveals nothing else, the original pressure drop could have been caused by a hole in the casing or an obstruction in the formation which broke through.

Almost ready to begin feeding liquid caustic. The tanker has been unloaded in a storage tank and a small 1-inch diameter pipe extended from the storage tank to the junction box. (Picture #14). A maintenance man will remain on duty all night for periodic sampling and to adjust the caustic feed rate based on the sampling results.

A sample was collected at the property line (B-1). The field pH was in the 5.5-6.0 range. The discharge continued to have a tannish-white color and to be high in suspended solids.

A stream sampling survey was again conducted. A summary of the results of that survey and of comments and observations is presented on Page 35. For the first time, field pH's in the receiving stream were found to be acceptable, but, unnatural bottom deposits were beginning to accumulate. See Picture #'s 15-17 on Page 16. There were no visible effects after the first tributary mixed in with the main branch of the Scattering Fork at C-5.

April 13, 1973

9:30 a.m.: Russ Hamm calls. Hydrostatic pressure testing has begun. Will take a full working day. Began adding caustic about 6:00 p.m. last night. Samples are being collected every two hours with adjustments in the feed rate being made as needed. If all goes well, they may be back in operation by Monday (April 16). Writer indicates that sludge deposits are beginning to accumulate downstream and that they will be held responsible for these. Might consider construction of an impoundment basin at tile system outlet if permission could be obtained from farmer who owns land. This would provide settling and retention of solids in a limited area with hopefully a better overflow to the receiving stream.

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Surveillance Report

9:00 a.m. - 10:30 a.m.: Sanitary Inspector John Bell conducts sampling survey. A summary is presented on Page 40. Field pH's generally acceptable; but, unnatural color and bottom deposits now extend to Station C-6. See Picture #'s 20-26 on Pages 17-19.

April 16, 1973

9:30 a.m.: Russell Hamm calls. Testing of tubing completed Friday, April 13; casing logged on Saturday; and tubing reinstalled on Sunday. No holes or defects were detected. The uppermost 48 couplings were replaced with new ones as a precautionary method. They are still unable to explain their original loss of pressure. It may have been due to a shift in the geological formation into which they were pumping. Currently pumping oil back into outer annulus and building pressure back up. Still feeding pencil stream of liquid caustic and checking pH at property line every two hours. Eighty percent of the readings have been above 6.0. High suspended solids are still present in the discharge.

9:00 a.m. - 10:30 a.m.: Sanitary Inspector Bell conducts sampling survey
(See summary on page 45).

4:45 p.m.: Russell Hamm calls. Waiting for epoxy cement to cure before starting to pump to deep well again. Should be pumping by 6:00 p.m.

April 17, 1973

9:30 a.m.: Russell Hamm calls. Well began taking flow at 5:30 p.m. preceding night. Reached steady conditions at 7:00 p.m. Overflow from ponds was discontinued at approximately 4:30 p.m. and caustic

feed was shut off. Samples collected this morning show pH of 7.0 at property line and 7.3 at the outlet of the tile system. Will call if anything develops but situation is now back to normal.

9:00 a.m. - 10:00 a.m.: Sanitary Inspector Bell conducts sampling survey.

Results are summarized on Page 50. All field pH's are acceptable and clear flow is observed. Chemical analyses are typical of what they had been prior to this incident.

SUMMARY

Based on the herein reported investigation, it is concluded that Cabot Corporation discharged contaminated water as a result of "forced" down time of their disposal well from April 10 through April 16, 1973. Adequate evidence appears to exist to allege the following violations of the Environmental Protection Act and the Water Pollution Regulations of Illinois as a result of this pollutorial discharge.

Section 12(a) - April 10, 11, 12, 13, and 16

Rule 203(a) - April 10, 11, 12, 13, and 16

Rule 203(b) - April 10, and 11

Rule 203(f) - April 10, 11, 12, 13, and 16 w.r.t. chlorides

Rule 203(f) - April 10, 11, 12, 13, and 16 w.r.t. total dissolved solids

Rule 403 - April 10, 11, 12, 13, and 16

A referral checklist will be initiated.

G. T. Bachman

G. T. Bachman, EPE
Wabash Sub-Unit

GTB:bh
5/29/73

cc: - K. L. Baumann, Supervisor
Ohio Basin Unit.